Additional File 3: Settings and procedures for 3-D inversion

Full components of the MT impedance tensors and geomagnetic transfer functions for 16 periods between 0.0667 and 1820 s were used as input data. To reduce the number of mesh nodes, we rotated the impedances to the azimuth of the model geometry such that the *x*- and *y*-axes were aligned N5°W and N85°E, respectively. Error floors were applied to all components of MT impedance at 5% of the magnitude of the sum of the squared elements invariant (Rung-Arunwan et al. 2017; Szarka and Menvielle 1997). Error floors were also applied to the geomagnetic transfer functions at 0.05.

The 3-D resistivity model space covered a region of 3236 (*x*-axis) × 3420 (*y*-axis) × 1049 (*z*-axis, without air layers) km discretized into 33 (*x*-axis) × 79 (*y*-axis) × 37 (*z*-axis, without air layers) blocks. The lengths and widths of the blocks near the center of the model space that cover only the area of the MT array (36 (*x*-axis) × 220 (*y*-axis) km) were 4 km, but were widened by factors of 1.25 to 1.75 outside the MT station array. We fixed the resistivity within model blocks containing more than 50% by volume seawater (according to the ETOPO1 global relief model of Amante and Eakins 2009) at 0.3 Ωm. Land topography and lake bathymetry were ignored in the inversion.

The inversion procedure was started with an initial homogeneous 100 Ωm model (excluding the seawater area). The same model was adopted as the prior model for each subsequent iteration. We performed five iterations of inversion and obtained a minimum root mean square (RMS) misfit of 2.400 with the fifth iteration, reduced from an initial misfit of 11.13. Although the inversion code is based on Occam's scheme, we assumed the minimum RMS model to be the best model because the RMS misfit did not reach 1.000. We then performed five more iterations adopting the previous minimum RMS misfit model as both the prior model and the initial model. The minimum RMS misfit for the fifth iteration model was 2.082, and we adopted it as the final inverted model.

References

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